Comparable and Consistent Content and Context

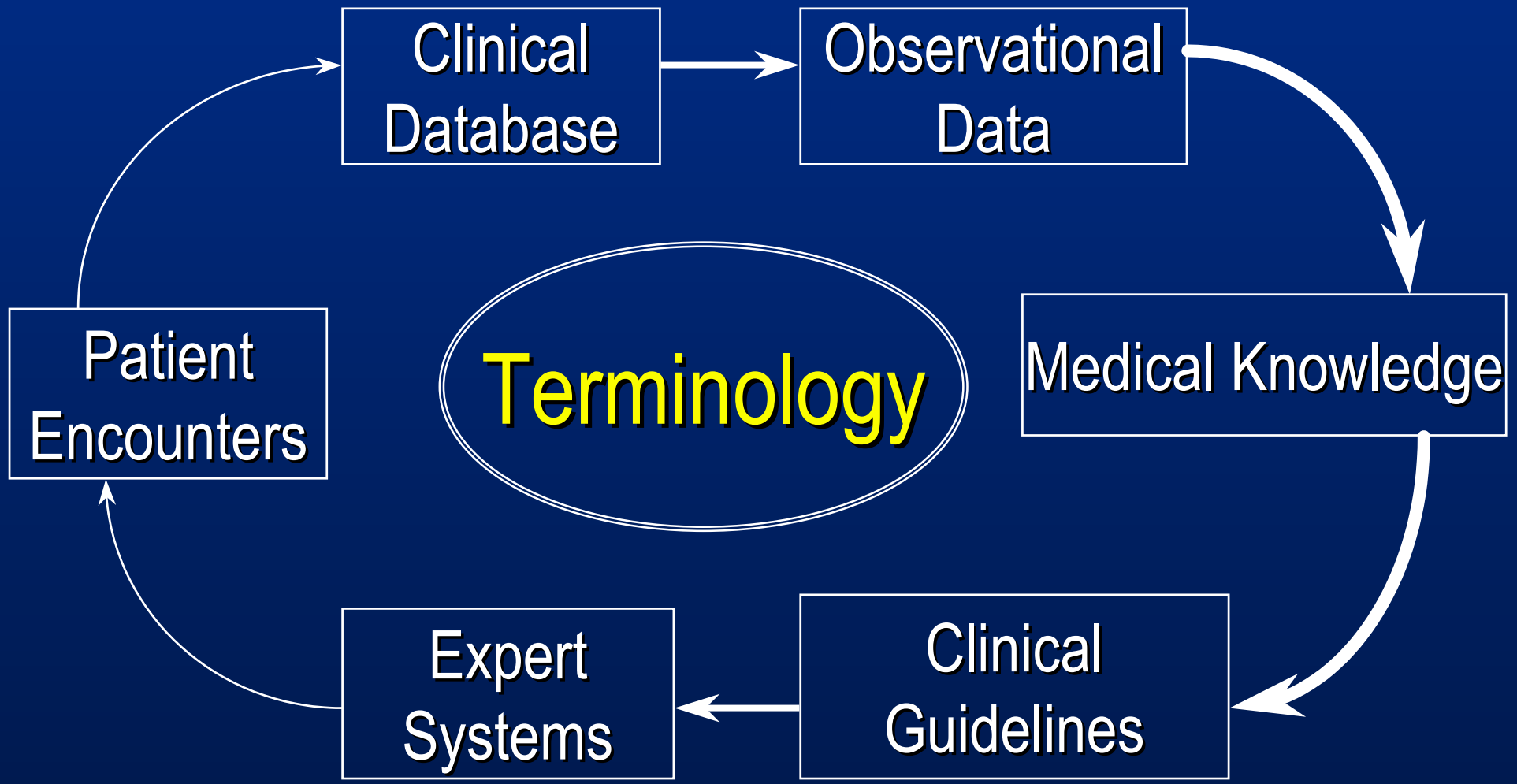
Terminology and Information Models

Christopher G. Chute, M.D., Dr.P.H.
Professor and Head, Medical Informatics
Mayo Clinic
Rochester, Minnesota

Potential Inherent in Patient Data

- Disease Natural History
- Treatment Response (non-RCT)
- Basis for Guidelines, Clinical Paths, Best Practice – Error Reduction
- "Just in Time" Source for Decision Support
  - Have *we* seen a patient just like this…
- **Efficient and Effective Care Delivery**

Necessary Component: Content
Central Role of Terminology



Content is Not Sufficient: Has Context in "structure" of Record

- Family History of Breast Cancer
- Family History of Heart Disease
- Family History of Stroke

vs.

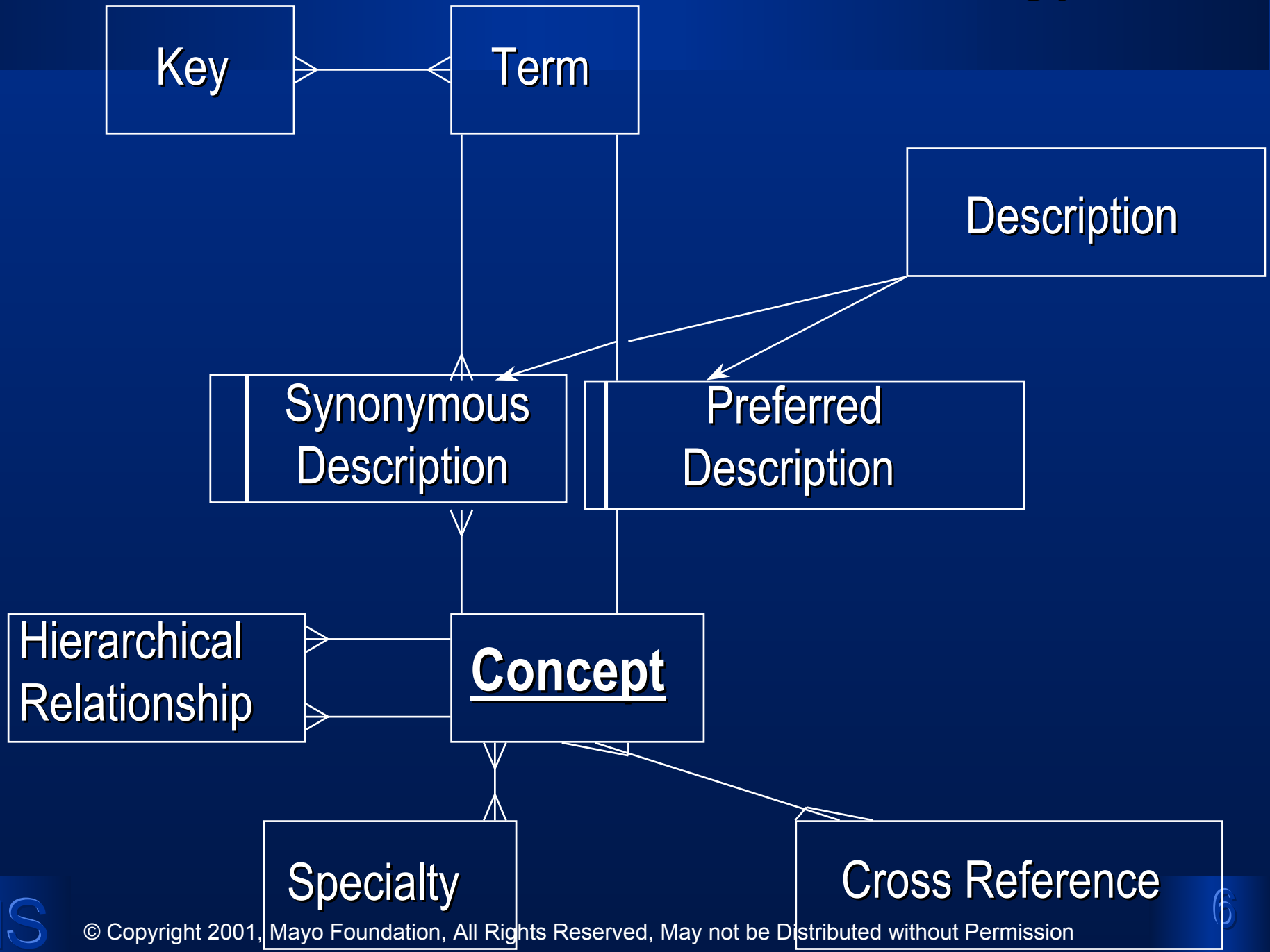
Family History

Breast Cancer
Heart Disease
Stroke

Message: Content and Context Boundary Between Terminology and Models

- Acknowledge Multiple Uses of Patient Record to Improve Care
- Heritage of Advocating Comparable and Consistent Data (Content) Representation
- Recognition that Context, as Manifest in Information Models, is Crucial

NHS Clinical Terms V 3 Structure
An Information Model of A Terminology



Unified Medical Language System Information Model

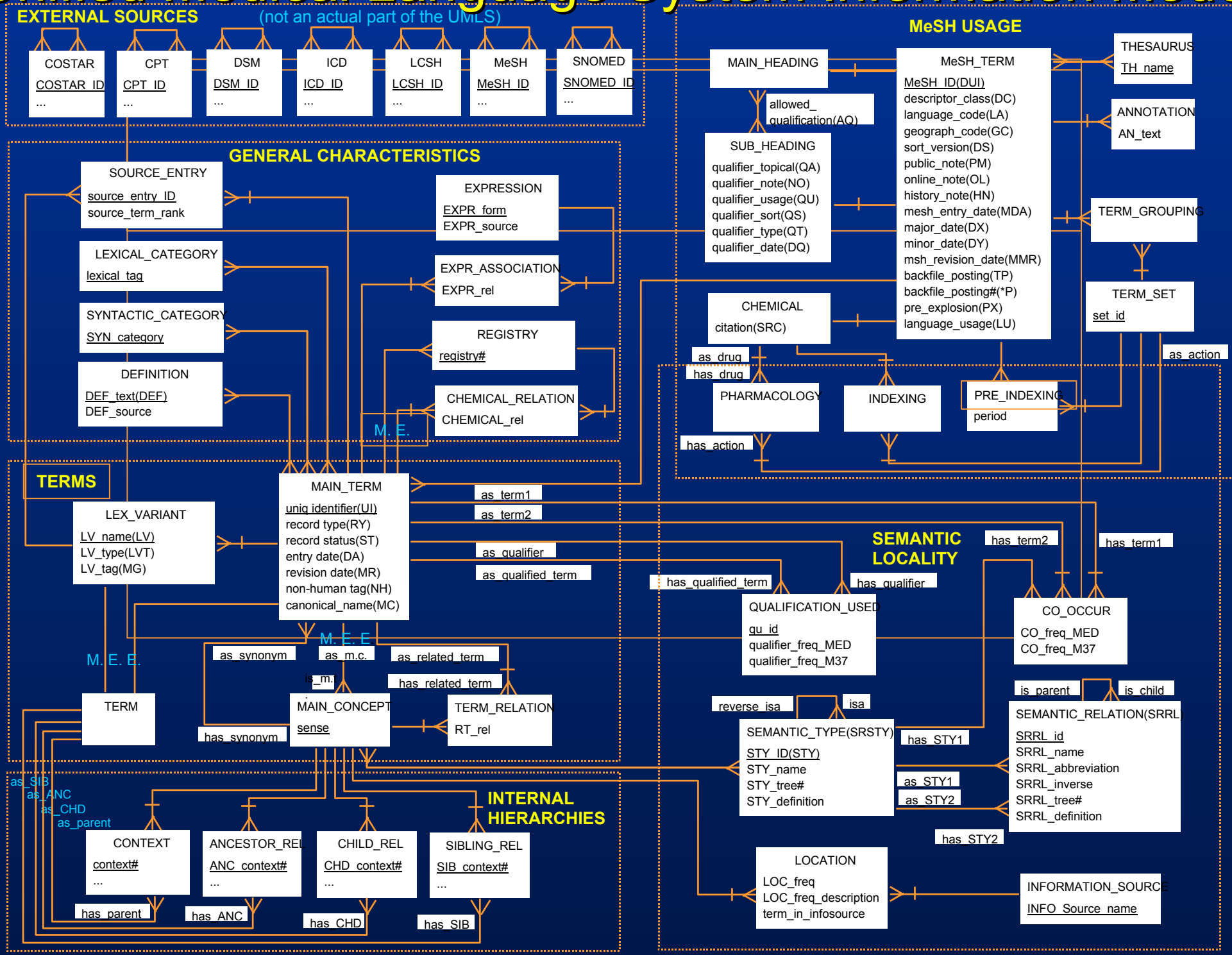
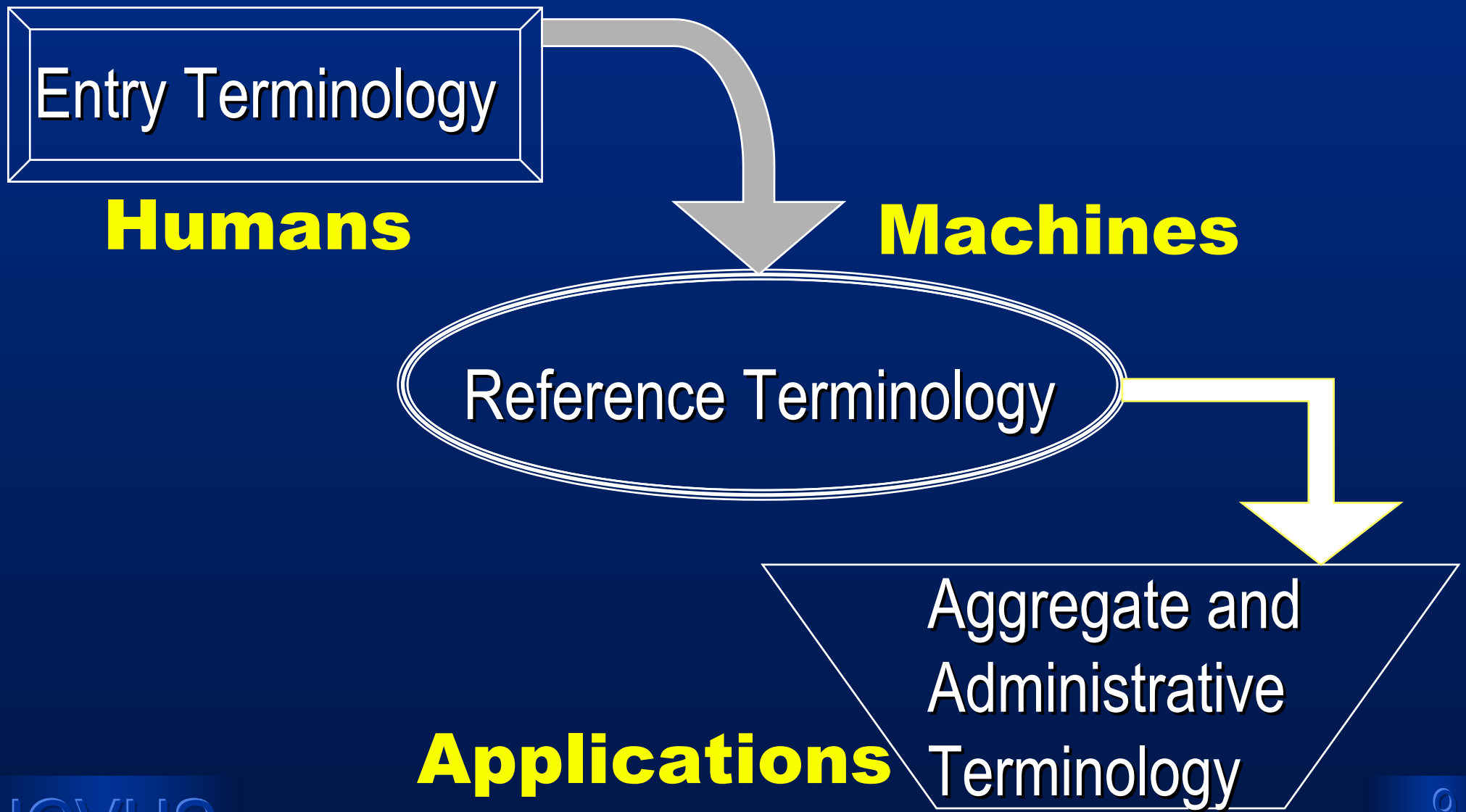


Figure 2. LDS of UMLS (Sept'90 CDROM version)

Familiar Points Along Continuum
Simple Notion of Meta-Context

- Nomenclature – Highly Detailed Descriptions (SNOMED)
- Classification – Organized Aggregation of Descriptions into a Rubric (ICDs)
- Groupings – High Level Categories of Rubrics (DRGs)

Terminology Systems Relationships Functional Role in Use



What Then, is an "Information Model"

- A Logical Structure that Asserts the Roles and Relationships Among Parts of the Medical Records
- A Practical Resource that Helps to Define the Context (in the record) of A Piece of Health Information

Recall That Interpreting Information is Dependent on Context

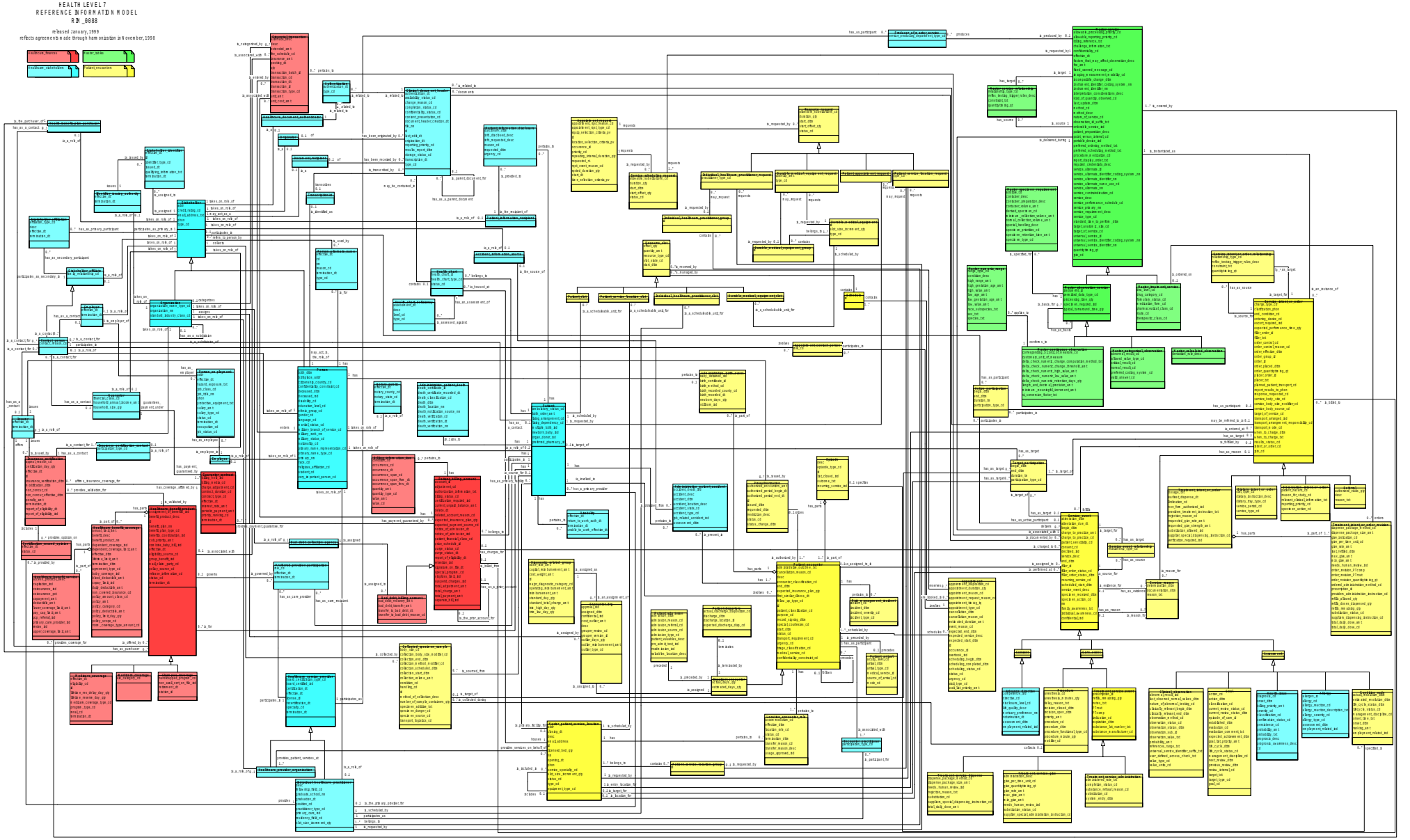
- Family History of Breast Cancer
- Family History of Heart Disease
- Family History of Stroke

vs.

Family History

Breast Cancer
Heart Disease
Stroke

Data Model Standards
The HL7 Reference Information Model



How Do We Keep All This Straight?
Comparable and Consistent, Content and Structure

The Role of MetaData

- Metadata is Data About Data
  - Names of Data Elements – Correspondence

    Sex maps to Gender
  - Values of Data Elements

    01 maps to Female maps to F
  - Can Include Structure of Data

The US Health Information Knowledgebase USHIK

- Metadata About Health Information Standards – Content and Structure
- Vocabularies, Messaging Standards, Information Models
- Illustrates Correspondence Across Overlapping Standards
- Begins to Define the Big Picture

Christopher G. Chute MD, DrPH
Professor and Head, Medical Informatics
Mayo Clinic
Rochester, MN 55905

Ph: 507 284 5541
Fx: 507 284 0360
Em: chute@Mayo.edu